REMARKS

Examiner Interview/Amendments to claim 33

Applicants thank the Examiner for the telephone interview on November 9, 2004 though no agreement was reached. The Examiner and Applicant discussed claim 33 which has been amended based on the Examiner's suggestions.

As amended claim 33 recites a processor that includes multiple multi-threaded programmable processing engines that include at least one register. The engines are operationally coupled to an interface that includes at least one register and logic to collect status data indicating whether at least one media access device has received packet data. The interface also include logic to perform an unsolicited transfer of at least a portion of the collected status data stored in the at least one register to at least one register of the multiple multi-threaded programmable processing engines.

An example of a system implementing elements recited in claim 33 is illustrated in FIGs. 1 and 2 of the application. As described in the application, the FIFO bus interface 38 collects status data from the MAC devices 14, 14', 14" and stores the status data in status registers 54. The status data is then transferred by push engine 62 to registers of engines 22a-22f. Software threads executing on the engines can then access the status data and schedule transfer of the packets for subsequent processing (e.g., a routing decision, etc.). This narration of FIGs. 1 and 2 is, again, merely an example and other systems may implement the recited features differently and/or feature different architectures than FIGs. 1 and 2.

The remainder of the these remarks respond to the Examiner's comments in the Office Action mailed 6/30/04 (shown in small, bold-faced print):

2. Claims 1, 9, 18, 28, 33, 34 and 36 are rejected under 35 U.S.C. 112 first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected to make and/or use the invention. The limitation of, "media access control device", is not specifically found in the specification.

Applicants have amended the claims to recite "media access devices" instead of "media access control devices." The term "media access device" is intended to encompass a MAC, as described in the specification, and other media access devices.

3. Claims 33 and 35 are rejected under 35 U.S.C. first paragraph, as failing to comply with the enablement requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitation of, "multiple multi-threaded programmable processing engines", is not specifically found in the specification".

The specification includes support for this recitation in a variety of passages. For example, the specification describes the processor 12 as having "an array of identical processing engines 22a-22f. Each processing engine 22a-22f has an internal structure for executing a plurality of, e.g., four, independent threads". The specification further describes that other processors "may control and/or reprogram the processor core 44 or other components 22a-22f, 38 of the multiprocessor 12".

6. Claim 1 states, "received packet data", and "transfers of data packets". It is uncertain if the Applicant means for these terms to have the same meaning. Clarification and/or an amendment are requested to overcome this rejection.

Applicants have amended claim 1.

7. Claim 2 states, "one or more input transfer registers to receive the unsolicited transfers of status data for use to schedule the transfers of data packets." It is unclear as to how this transfer can occur because it is not stated as to how or where the "input transfer registers" are connected in the processing engines.

Claim 2 recites that the transfer registers are part of the processing engines. As an example, FIG. 3, a diagram of a sample engine, depicts transfer registers 78, 80.

8. Claims 3, 6-8, 10, 14, 21-23 and 31 recites the limitation "the devices". There is insufficient antecedant basis for this limitation in the claim.

Antecedant basis is provided by the "media access devices" recited in the corresponding independent claims.

10. Claims 1-5, 7-11, 13, 14, 16, 17 and 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld et al. U.S. Patent No. 5592622 (hereinafter Isfeld) in view of Chilton et al. U.S. Patent No. 6418488 (hereinafter Chilton) in further view of Witkowski et al. (6430626) (hereinafter Witkowski).

11. Referencing claim 1, as closely interpreted by the Examiner, Isfeld teaches a processor, comprising:

12. media access control device, (e.g., col. 7, lines 10-48, "MAC devices");

13. one or more processing engines to schedule transfers of data packets between the processor and the devices, (e.g., col. 8, line 50 - col. 9, line 15);

14. a push engine to perform unsolicited transfers of the status data to the processing engines to response to the module collecting new status data, (e.g., col. 9, lines 11-34 & col. 10, line 12 - col. 11, line 67 & col. 23, line 45- col. 24, line 15). Isfeld does not specifically teach a module configured to collect status data from devices connected to a bus, the status data indicating readiness of the devices to participate in data transfers

31. Claims 9, 10, 11, 13, 17, 33, 35, and 36 are rejected for similar reasons as stated above.

Isfeld describes a system that includes multiple IOPs. Each IOP can have multiple MAC devices (70-1, 70-2, 70-N in FIG. 4 of Isfeld). FIG. 6 and the corresponding text identified by the Examiner illustrates sample operation of the system. In particular, FIG. 6 illustrates a packet received by IOP4 being pushed to IOP5. As emphasized in Isfeld, IOP5 receives a packet from IOP4 without solicitation or warning. More relevantly, IOP5 would have no idea of the status of the MAC devices of IOP4. In other words, receiving a packet, is very different than receiving status data indicating the readiness of one of the MAC devices to participate in a data transfer. More succinctly put: the status data ≠ a packet. Thus, Isfeld does not describe a "transfer of status data indicating readiness of the media access devices to participate in data transfers" as recited by claim 1. Nor does the Examiner provide a suggestion as to why the status data of the IOP MACs should be transmitted to another IOP, especially in view of Isfeld's stated goal of minimizing bus traffic.

In view of this, Applicants respectfully request that the Examiner withdraw the 103 rejection of claim 1 and its dependent claims.

For similar reasons, Applicant request that the Examiner withdraw the 103 rejection of claim 9 and its dependent claims.

42. Claims 18, 19, 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahim (5887134) in view of Gulledge (5644623) in further view of Witkowski (6430626).

43. Referencing claim 18, as closely interpreted by the Examiner, Ebrahim teaches a router, comprising:

44. a bus, (e.g., col. 1, lines 36-48); and

45. a parallel processor coupled to the bus and comprising, (e.g., col. 1, lines 36-48):

46. a plurality of processing engines to process data transfers with a plurality of devices connected to the bus, (e.g., col. 15, lines 19-37);

47. the status data indicating readiness of the devices to participate in data transfers (e.g., col. 5, line 65-col. 6, line 14 & col. 11, line 36-col. 12, line 17). Ebrahim does not specifically teach an interface connected to collect ready status data from the media access control devices and to automatically transfer ready status data the processing engines in

respond to the ready status data being collected, the ready status data comprising data indicating whether a one of the media access control devices has received packet data, and media access control device.

48. Gulledge teaches an interface connected to collect status data from the devices and to automatically transfer status data the processing engines in response to the status data being collected, (e.g., col. 14, lines 44-63). It would have been obvious to one skilled in the art at the time the invention was made to combine Gulledge with Ebrahim because it would be faster if the status was automatically transfer once the status data was collected. This coul daid in the shortening of latency. Gulledge does not specifically teach the ready status data comprising data indicating whether a one of the media access control devices has received packet data.

49. Witkowski teaches media access control device (e.g., col. 50, lines 1-23), and

50. the ready status data comprising data indicating whether a one of the media access control devices has received packet data, (e.g., col. 20, line 45-col. 21, line 28, "The RX MCB interface 530 asserts a signal RX_PKT_AVAIL* to the MCB 404 when packet data is in one of the RX BUFs 520, 522..."). It would have been obvious to one skilled in the art at the time the invention was made to combine Witkowski with the combine system of Ebrahim and Gulledge because of similar reasons as stated above in claim.

As understood by the Applicants, the Examiner seems to propose modifying the processing node 102-1 of FIG.1 of Ebrahim to include an interface to automatically collect historic statistics about the quality of service experienced by different handsets of a cellular phone network as described in Gulledge. Applicants do not agree that one of skill in the art would design interface circuitry in the general purpose processor of Ebrahim solely for the purpose of an infrequent file transfer.

The Examiner then seems to propose replacing the historic statistics about the quality of service experienced by different cellular handsets of Gulledge with MAC status data "for the same reasons as in claim 1". To the extent the rejection is properly understood by the Applicants, Applicants disagree that it would have been obvious to modify a cellular handset quality measuring scheme to collect historical statistics about MACs, nor do the references provide or imply such a motivation. In fact, such a modification would undermine the goal of Gulledge to improve the quality of service experienced by cellphone users.

Finally, even if such a combination was constructed it would not provide a router that includes an interface to "transfer ready status data to the processing engines in response to the status data being collected, the ready status data indicating readiness of the devices to participate in data transfers, the ready status data comprising data indicating whether a one of the media access devices has received packet data".

Applicants respectfully request withdrawal of the 103 rejection.

66. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Loughlin et al. (6275505) (hereinafter O'Loughlin) in view of Witkowski (6430626) in further view of Isfeld (5592622).

67. As per claim 28, O'Loughlin teaches an article comprising a computer-readable medium which stores executable instructions for transferring data packets over a bus, the instructions causing a processor to, (e.g., col. 10, lines 20-33):

68. But, O'Loughlin does not specifically teach collect information on readiness of devices connected to the bus to one of transmit and receive data packets; and

69. transfer a portion of the collected information to a processing engine configured to schedule data transfers, the transferring being unsolicited by the processing engine. Witkowski teaches information on readiness of devices, (e.g., col. 20, line 45-col. 21, line 28, "The RX MCB interface 530 asserts a signal RX_PKT_AVAIL* to the MCB 404 when packet data is in one of the RX BUFs 520, 522..."), and the devices connected to the bus to one of transmit and receive data packets, (e.g., col. 23, lines 14-47 & col. 24, lines 13-43). It would have been obvious to one skilled in teh art at the time the invention was made to combine Witkowski with O'Loughlin because it would be more efficient to transmit and receive data when th edevices is ready. If the device is not ready it could receive or transmit incorrect data leading to errors. Isfeld teaches transfer a portion of the collected information to a processing engine configured to schedule data transfers, the transferring being unsolicited by the processing engine, (e.g., col. 23, line 45- col. 24, line 15). It would have been obvious to one skilled in the art at the time the invention was made to combine Isfeld with the combined system of O'Loughlin and Witkowski because it would be more efficient if data that was more important was to be transferred first. Furthermore, it would be faster if the data that was transmitted were unsolicited because the data would not use up time in unncessary processing.

As described above (see page 10 of this response), Isfeld describes scheduling transfer of packets not transfers of status data of a media access device. Nor is such a transfer consistent with the goal of Isfeld that seeks to minimize bus traffic by limiting it to packet "pushes".

Applicants thus request withdrawal of the 103 rejection

The Examiner is invited to call **Rob Greenberg at 978-553-2060** to discuss the case at any time.

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Applicants have enclosed the fee for a two month extension of time. Please apply any additional fees to Deposit Account No. 06-1050, referencing attorney docket number: 10559-128001.

Respectfully submitted,

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